

CLAIMS

1. A method of forming a floating charge pump
5 comprising:

referencing an output capacitor of the floating
charge pump to a high side voltage.

2. The method of claim 1 wherein referencing the
10 output capacitor of the floating charge pump to the high
side voltage includes coupling one terminal of the output
capacitor to receive the high side voltage and coupling a
second terminal of the output capacitor to receive a pump
voltage of the floating charge pump.

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3. The method of claim 1 wherein referencing the
output capacitor of the floating charge pump to the high
side voltage includes coupling the output capacitor to
charge to a voltage substantially equal to a pump voltage
20 of the floating charge pump.

4. The method of claim 1 further including coupling
a pump capacitor to charge to a voltage substantially
equal to the high side voltage plus a pump voltage of the
25 floating charge pump.

5. The method of claim 1 further including forming a
charge pump controller operably coupled to generate a pump
voltage of the floating charge pump and generate a series
30 of pulses having a voltage swing equal to the pump
voltage.

6. The method of claim 5 wherein forming the charge pump controller operably coupled to generate the pump voltage includes coupling the charge pump controller to generate a regulated voltage and to couple the regulated
5 voltage to an output of the charge pump controller to generate the pump voltage.

7. The method of claim 1 further including coupling the floating charge pump to disable charging the output
10 capacitor when a pump voltage of the floating charge pump exceeds a protection value.

8. A floating charge pump circuit comprising:
 an first input coupled to receive an input voltage;
 and
 an output capacitor referenced to the input voltage.

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9. The floating charge pump circuit of claim 8
 wherein the output capacitor referenced to the input
 voltage includes the output capacitor operably coupled to
 charge to a voltage substantially equal to a pump voltage
 10 of the floating charge pump circuit.

10. The floating charge pump circuit of claim 8
 wherein the output capacitor referenced to the input
 voltage includes a first terminal of the output capacitor
 15 referenced to the input voltage and a second terminal
 coupled to receive a pump voltage of the floating charge
 pump circuit.

11. The floating charge pump circuit of claim 8
 20 further including a charge pump capacitor coupled to
 receive a pump voltage of the floating charge pump circuit
 and to receive the input voltage, the charge pump
 capacitor having a first terminal and a second terminal.

12. The floating charge pump circuit of claim 11
 25 further including a first diode coupled to the first
 terminal of the charge pump capacitor and coupled to
 receive the input voltage.

13. The floating charge pump circuit of claim 11
 30 further including the output capacitor having a first
 terminal coupled to receive the input voltage and a second
 terminal coupled to a second diode, the second diode
 coupled to the first terminal of the charge pump
 35 capacitor.

14. The floating charge pump circuit of claim 8 further including a charge pump controller coupled to receive the input voltage and responsively form a pump voltage of the floating charge pump circuit.

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15. The floating charge pump circuit of claim 14 wherein the charge pump controller is operably coupled to disable charging the output capacitor when a pump voltage of the floating charge pump circuit exceeds a protection

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value.

16. A method of forming a charge pump controller comprising:

forming a first input operable for receiving a feedback signal representative of an internal regulated voltage of the charge pump controller; and

coupling the charge pump controller to disable generating a charge pump signal when the internal regulated voltage exceeds a protection value of the charge pump controller.

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17. The method of claim 16 wherein forming a first input operable for receiving a feedback signal representative of an internal regulated voltage of the charge pump controller includes coupling a voltage

regulator to form the internal regulated voltage including coupling the voltage regulator to receive a reference voltage.

18. The method of claim 17 further including coupling a comparator to receive the reference voltage and disable generating the charge pump signal when the feedback signal exceeds the reference voltage by a first value.

19. The method of claim 17 further including coupling an amplifier to receive the reference voltage and the feedback signal and responsively drive a regulator transistor to generate the internal regulated voltage.